

The Problem with POISONOUS PLASTICS

**New research
proves that
PVCs and
phthalates
contaminate our
environment
and the food we
eat, causing
disruption of
our hormonal
and glandular
systems.**

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"The agreements between the big oil companies, in particular, show that any law of the state becomes meaningless for them, and that all forms of jurisdiction of the national state are done away with."

— Dr Fritz Werr, National Socialist economist, 1936,
quoted in Reimann's *Patents for Hitler* (1942)

As consumers, we implicitly trust food manufacturers and governments to maintain appropriate safeguards to prevent food contamination and its toxic or chronic effects. Australian health officials recently ordered an investigation of locally manufactured baby milk formula, following the discovery of PVC plasticisers or phthalates ("thal-ates") in UK varieties. The Secretary for Health and Family Services, Senator Robert Woods, announced there was no immediate risk to Australians: "This situation in the United Kingdom does not mean we have any reason for concern...we must quickly investigate to see if these substances are present at all in Australian products." Results from Senator Woods' enquiry into phthalates in infant formula in Australia have not been released to date.

A toxic by-product of the petroleum industry, naphthalates (phthalates) were first discovered in the 1850s. From the early 1900s through the 1930s, a number of companies, most notably I. G. Farben (now known as Hoechst, Bayer, Roche and BASF), Standard Oil (EXXON and ESSO) and Shell, developed a wide range of synthetic oil-based products under umbrella patents for commercial use. One of these products, PVC (polyvinyl chloride), is now used in an enormous range of applications in building, electrical, health-care and transport.¹ No known long-term research was ever carried out on the possible systemic effects on either humans or the environment.

A deadly cocktail of chemicals and compounds, such as DEHP, or di(2-ethylhexyl) phthalate, and p-nonylphenol (used to make PVC more stable and impact-resistant), is used in the manufacture of most PVC products. Of these, DEHP accounts for up to 90 per cent of annual global phthalate production (over 3.25 million tonnes). Both DEHP and nonylphenol are potential carcinogens and may disrupt normal hormonal function. There are other possible side-effects which adversely affect reproductive ability, the developing embryo and foetus, and the reproductive ability of offspring, as well as disorders which cause delay or lack of conception, such as menstrual disorders, hormonal problems, impotence, sperm abnormalities, and uterine fibroid and tubal defects. Adverse birth effects may include spontaneous abortion, stillbirth, toxæmia, low birthweight, congenital defects and childhood cancer.

Phthalates and the stabiliser nonylphenol are xeno-oestrogens, in that they mimic naturally-occurring oestrogens, and are thought to disrupt the body's complex chemical communications (endocrine) system. This system consists of a number of glands—pituitary, thyroid, parathyroid and adrenal glands—and part of the pancreas, testes and ovaries. Each gland secretes hormones to signal specific changes in cells affecting body function, development, mineral balance and metabolism. Natural hormones, including those we get from plants and vegetables (phyto-oestrogens), complete their tasks and then break down inside the body. Humans and animals have consumed phyto-oestrogens for millions of years and adapted accordingly. Xeno-oestrogens have been consumed involuntarily for the past 50 years, but at what cost?

In 1987, *Choice* magazine reported high levels of phthalates in cheeses wrapped with PVC film (430 mg/kg in some brands). Following this, the Australian National Health and Medical Research Council (NHMRC) set up a working group to examine phthalate levels in food. Despite the group's toxicologists stressing that toxicology was not a defini-

tive science, and that further data or changed circumstances could lead to entirely different findings, several conclusions were drawn: phthalates migrating into food did not constitute a 'toxic' risk, and there was no need for concern over daily intake levels. Minimising phthalates in food was, however, highly desirable.² A number of proposals were suggested regarding labelling regulations for PVC film. Representatives from the plastics industry stressed that self-regulation was still desirable and that proposals to apply warning labels would be resisted.

In 1989, phthalates in PVC mattress covers were linked to cot-death syndrome in studies by Penarth Research International. Subsequent studies refuted Penarth's findings, yet phthalates, particularly DEHP, have been implicated in fatal lung conditions in newborns using PVC ventilators. Parents of newborns are currently advised to place their babies on their backs and remove any plastic (PVC) toys and cot bumpers to reduce the risk of SIDS.

A 1989 meeting of the Australian Committee on Toxicity (COT) considered DEHP for the fourth time, to examine the possibility that DEHP may be responsible for congenital birth defects when combined with chemicals like caffeine. The Committee found there was no reason for concern over human exposure and that no further action was required. Of interest, the United States Food and Drug Administration (FDA) insists on a warning label on any medical products containing DEHP.

In 1992, Australian Standard AS 2070, "Plastics for Food Contact Use", reflected the findings of the NHMRC's 1987 report. AS 2070 contained a warning to food manufacturers of the dangers of biologically active substances (phthalates) migrating into food products via plastic packaging or wrapping materials, including possible "toxic" or "chronic" effects to consumers: "It is essential that the formulation of the plastics materials is such that any migration of substances into the

food from the plastics packaging or wrapping materials is minimised and, if migration occurs, no known toxic hazard will exist to the consumer of the food... Chronic effects...are possible where small quantities of biologically active substances transfer from packaging materials and are ingested in small amounts over a long period of time." AS 2070 came into existence in 1977, yet it contained exactly the same warning as the 1992 Standard.

The World Health Organization (WHO) also published a report on DEHP in 1992. It found DEHP is readily absorbed in soil, is more soluble in blood than water, is highly lipophilic (i.e., loves fat), and is persistent, accumulating in plants and animals. Atmospheric pollution was identified as the major source of contamination, industrial areas generally having the highest levels of DEHP. Blood transfusions and medical treatment using plastic devices were listed as sources of involuntary human exposure to DEHP, the most consistent side-effect of DEHP being testicular atrophy. In 1986 Her Majesty's Stationery Office also reported testicular atrophy in patients undergoing regular dialysis.

A number of questions regarding the types of plastic used in blood bags, intravenous tubing and medical products were recently directed to members of the medical industry. Spokesperson for the Red Cross Blood Bank, Dr Richard Kimber, stated he was unaware of any problem associated with PVC blood bags and suggested contacting the manufacturers.

The multinational Baxter HealthCare, supplier of blood bags

and plastic medical products to Australian hospitals and medical centres, recently stated: "...we [Baxter HealthCare] are not in a position to speak on behalf of the industry" regarding "plastics products for medical use".

Baxter HealthCare suggested I contact the Medical Industry Association of Australia with my questions. The MIAA could not understand Baxter's failure to answer questions relating to the products it manufactures, and, meantime, has not been able to contact Baxter for their statement on these questions:

1) What type of plastic/s is used for: (a) blood packaging, etc.?.; (b) intravenous drip tubing, etc.?.; (c) ventilator tubing and masks, etc.?.

2) Have any tests been carried out on these products (1 a,b,c) to determine if any 'biologically active' substances transfer from packaging, tubing, etc. to patients?

3) Could the findings and conclusions of such tests be made available?

The medical industry is well aware of the migration of DEHP into blood stored in PVC bags. Dr Max Whisson, from the Research and Development Unit of the Australian Red Cross in Western Australia, has published a number of papers on the use of PVC blood bags. Concerned by the use of DEHP, Dr Whisson found its use is based on errors in interpretation of blood cell biology.

DEHP migrates readily into red blood cell platelets, somehow increasing the shelf-life of blood products. Long-term exposure to DEHP in the bloodstream may also be linked to an increased risk of heart attack, as DEHP reduces contractile strength of the heart muscle.

In 1992, WHO recommended that disposal practices for DEHP be improved, that steps be taken to reduce the release of DEHP into the environment, and that medical products that contribute to the body burden of DEHP be scrutinised to reduce exposure.

The UK Ministry of Agriculture, Fisheries and Food (MAFF) found phthalates present in every food sample taken since 1993, including meat, fish, eggs, milk and milk products. MAFF estimated that daily intake of phthalates in adults averaged between 0.8 mg per day and up to 1.6 mg per day. Studies in 1995 found high levels of phthalates in infant formula, potato chips, chocolate bars, margarine, milk products and vegetable oils. Products packaged in paper and board, such as cakes, fats and confectionery, also contained high levels of phthalates. Gravy and vegetable burger mix, biscuits and vegetable fat had high concentrations. Every baby milk formula tested contained phthalates.³ The most contaminated baby milk had concentrations that gave a total daily intake of 0.023 mg per kg of bodyweight. This is only four times lower than levels shown to reduce sperm-count in rats. Safety levels in humans are normally a minimum of 100 times lower than levels shown to cause harm in animals—not four times.

In 1995, doctors from New York's Strang-Cornell Cancer Research Laboratory suggested that xeno-oestrogens found in plastics and pesticides increased breast cancer rates in women. Women who experience early onset of menstruation, late onset of menopause, who have no children or who do not breastfeed their children are considered to be in higher-risk groups for breast cancer. Breastfeeding has been shown to lower the risk of breast cancer by reducing high oestrogen levels associated with pregnancy. The Nursing Mothers Association voiced its concern about the

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lack of public awareness concerning phthalates: "We would be surprised if many mothers were even aware of the potential problems." The Anti-Cancer Council of Victoria has preferred not to comment on phthalates, citing funding concerns.

A new book, *Our Stolen Future*, prompted the plastics industry to hold a seminar to discuss its implications: "*Our Stolen Future* is so dramatic, persuasive and comprehensive, it is likely to become the foundation of dozens of attacks on industrial products and processes... It is a comprehensive review of the potential impact of synthetic chemicals on human health," said an industry handout. A spokesperson for the Plastics and Chemicals Industries Association (PACIA) denied there were any proven serious or long-term health issues associated with phthalates, but stated, "...if there is an issue, it's a potentially serious one." PACIA noted its commitment to programs such as Responsible Care, aimed at improving its environmental performance.

Initiatives such as Responsible Care and the chemical and plastics industries' self-regulation were recently assessed by the Australian Centre for Environmental Law. It noted that the failures of self-regulation far outnumber its successes, and concluded that Responsible Care "...is unlikely to substantially improve...environmental performance of the chemical industry or regain the trust of the public in the industry's integrity".

A CSIRO study, commissioned and financed by PACIA, is due for release on 12th September 1996 [just as we go to press]. The study will undoubtedly side with industry claims, despite the principal researchers' personal misgivings concerning available data. The CSIRO's report will probably show that there is little evi-

dence regarding any 'proven' side-effects of xeno-oestrogens or hormone mimicry.⁴ Greenpeace was not asked to contribute to the study's findings and has called CSIRO's independence into question. And when CSIRO researchers are not permitted to speak or confer with other researchers, certain National Socialist policies enforced in pre-World War II Germany spring to mind.

Professor Mark Wahlqvist, head of the Department of Medicine at Monash University and Chairperson of the Australian Nutritional Foundation, expressed his concern: "We know there are naturally occurring oestrogens and xeno-oestrogens in the food chain...the latter being of some concern. Research is required to establish the levels of xeno-oestrogenic compounds in the human food chain and in human tissue, as a matter of priority." Recent studies have shown fish to change sex with long-term exposure to oestrogenic compounds. Phthalates and many other chemicals, such as DDT, 2,4,5-T, 2,4-D, PCBs and dioxins, continue to leave future generations with an unknown legacy.

Matt Ruchel, national toxics coordinator for Greenpeace Australia, believes industry

should stop using phthalates before it's too late: "Regulators and industry must adopt a precautionary approach and seek to eliminate pollution from these chemicals now, rather than wait for conclusive proof of harm...this will mean ceasing the manufacture of PVC plastics...the main sources and use of hormone-disrupting chemicals like phthalates and dioxin. The future of human reproduction and development is too important to us all."

The petrochemical industry insists there is no proof of any links or chronic health risks associated with the use of PVC or its many additives. Meanwhile, Australians, on a per-capita basis, rank

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PHthalates AND HEALTH

◇ Melbourne's Royal Children's Hospital Poison Advisory Centre did not consider a one-off exposure to oestrogen or oestrogenic compounds to be harmful, but "the exact toxic doses have not been determined". On the subject of phthalates, there was "no data available about possible systemic effects, although irritation to eyes, mucous membranes and skin has been reported".

◇ Figures from the Australian Bureau of Statistics and the Consultative Council on Obstetrics, Paediatric Mortality and Morbidity show the majority of infant deaths under the age of 12 months are associated with endocrine-related disorders, congenital defects, diseases of the nervous system and complications immediately before and after birth.

◇ Victoria's water management authorities and the Environmental Protection Authority do not monitor phthalate levels in water or air samples. Statistics from Victorian Health and Community Services reveal that Melbourne's industrial areas have higher rates of asthma and lung disease. Dr Geraldine Elliott, Executive Director of the Asthma Foundation of Victoria, suggested proper research should be a priority: "Increased awareness and balanced research is a very important process. Availability of known facts concerning various chemicals enables consumers to make up their own minds and reduce their exposure to irritants."

◇ Medical studies have suggested that sperm counts have fallen by up to 50 per cent over the last 50 years in some countries, with testicular cancer rates increasing dramatically in the same period. Several varieties of phthalates, including DEHP, are known testicular toxicants. A recent study on aborted male fetuses found they were already developing testicular cancer in the womb. Testicular cancer rates in agricultural countries also appear to be higher than those in non-agricultural countries. For example, testicular cancer rates in Denmark have risen 300 per cent, while rates in Finland have remained the same. The increase in abnormalities, including undescended testicles and genital malformation, appear to be related.

second only to the Americans in their consumption of PVC products. Our local industry (ICI and Auscon) has actually increased PVC manufacture.

Long-term research into PVC and phthalates would involve millions of dollars—money better spent on anti-cancer research, perhaps. If, as Senator Woods suggests, "there is no immediate risk", what of the risks to future generations?

Endnotes

¹ DEHP is used in such PVC-based products as acetates, adhesives, adhesive plaster foils, antiperspirants, air filters, automobile tyres, bandages, celluloid (film), carpets, casts, cosmetics, emulsion paints, engineering compounds, eyeglasses, filtration systems, food packaging, garden hose, hearing aids, inks, insect repellents, laminated cloth, lacquers, lubricants, packaging film, perfumes, pesticides, pharmaceuticals, pipes, plasticiser compounds, polyester fibres, protective gloves, PVC, resins, shower curtains, solvents, toys, vacuum pumps, vinyl flooring and upholstery, wallpapers, and wire coatings for electrical cable.

² Kraft Foods conducted independent research into phthalates some 15 years ago. Their report was unavailable for scrutiny, however, as "the results were inconclusive".

³ For the record, major manufacturers of baby milk formula in the UK are Nestlé, Milupa, H. J. Heinz and Cow & Gate and, in Australia, Wyeth, Nestlé, Mead Johnson, H. J. Heinz and Douglas Pharmaceuticals.

⁴ The CSIRO (the Australian Commonwealth Scientific and Industrial Research Organisation) has no official policy on phthalates as yet.

About the Author:

Barry Densley is a researcher and graphic artist who lives in Melbourne, Australia. He dedicates this article to his son, Anscar, and his wife, Cate. He also invites readers to comment on this article.

Barry is currently researching material for a screenplay based around man-made 'flying saucers' and the suppression of associated technology. His interests include the appropriation of German WWII military equipment and personnel upon Germany's capitulation, especially removal to other countries, e.g. Australia, Canada, United States, etc. Anyone with information on WWII German weapons technology, underground bases, merchant raiders, etc., who would like to exchange information, can phone Barry during office hours on (03) 9292 1411, or fax him on (03) 9292 1177. Barry can also be reached via e-mail at: bdensley@newscorp.com.au

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